

CLAIMS

What is claimed is:

- 5 1. A method for improving chemical mechanical polishing endpoint
detection during planarization of a semiconductor wafer, said method comprising the
step of:
 depositing a dielectric layer over a reflectance stop layer disposed above a
 component disposed on a semiconductor wafer, wherein said reflectance stop layer
10 substantially reduces any light from reflecting off of said component during a
determination of the thickness of said dielectric layer using a reflected signal of light.
2. A method for improving chemical mechanical polishing endpoint
detection during planarization of a semiconductor wafer as described in Claim 1
15 wherein said step comprises:
 depositing said dielectric layer over said reflectance stop layer, wherein said
reflectance stop layer is comprised of a silicon oxy-nitride.
3. A method for improving chemical mechanical polishing endpoint
20 detection during planarization of a semiconductor wafer as described in Claim 1
wherein said step comprises:
 depositing said dielectric layer over said reflectance stop layer, wherein said
reflectance stop layer is comprised of an amorphous silicon.

4. A method for improving chemical mechanical polishing endpoint detection during planarization of a semiconductor wafer as described in Claim 1 wherein said step comprises:

5 depositing said dielectric layer over said reflectance stop layer disposed above said component, wherein said component is comprised of a metal.

5. A method for improving chemical mechanical polishing endpoint detection during planarization of a semiconductor wafer as described in Claim 1 wherein said step comprises:

10 depositing said dielectric layer over said reflectance stop layer, wherein said dielectric layer is comprised of an oxide.

6. A method for improving chemical mechanical polishing endpoint detection during planarization of a semiconductor wafer as described in Claim 1 wherein said step comprises:

15 depositing said dielectric layer over said reflectance stop layer disposed above said component, wherein said dielectric layer is comprised of an oxide and said component is comprised of a metal.

20 7. A method for improving chemical mechanical polishing endpoint detection during planarization of a semiconductor wafer as described in Claim 1 wherein said step comprises:

depositing said dielectric layer over said reflectance stop layer disposed above said component, wherein said dielectric layer is comprised of an oxide, said

reflectance stop layer is comprised of a silicon oxy-nitride and said component is comprised of a metal.

8. A method for improving chemical mechanical polishing endpoint
5 detection during planarization of a semiconductor wafer as described in Claim 1
wherein said step comprises:
depositing said dielectric layer over said reflectance stop layer disposed
above said component, wherein said dielectric layer is comprised of an oxide, said
reflectance stop layer is comprised of an amorphous silicon and said component is
10 comprised of a metal.

9. A method for improving chemical mechanical polishing endpoint
detection during planarization of a semiconductor wafer, said method comprising the
steps of:
15 (a) depositing a reflectance stop layer above a component disposed on a
semiconductor wafer, wherein said reflectance stop layer substantially reduces any
light from reflecting off of said component;
(b) depositing a dielectric layer over said reflectance stop layer and said
component;
20 (c) removing material from said dielectric layer disposed above said
semiconductor wafer using a chemical mechanical polishing process;
(d) determining the thickness of said dielectric layer disposed above said
semiconductor wafer using a reflected signal of light; and

(e) in response to said dielectric layer substantially achieving a desired thickness, stopping said chemical mechanical polishing process of said semiconductor wafer.

5 10. A method for improving chemical mechanical polishing endpoint detection during planarization of a semiconductor wafer as described in Claim 9 wherein said step (a) comprises:
 depositing said reflectance stop layer above said component, wherein said reflectance stop layer is comprised of a silicon oxy-nitride.

10 11. A method for improving chemical mechanical polishing endpoint detection during planarization of a semiconductor wafer as described in Claim 9 wherein said step (a) comprises:
 depositing said reflectance stop layer above said component, wherein said
15 reflectance stop layer is comprised of an amorphous silicon.

 12. A method for improving chemical mechanical polishing endpoint detection during planarization of a semiconductor wafer as described in Claim 9 wherein said step (a) comprises:
20 depositing said reflectance stop layer above said component, wherein said component is comprised of a metal.

 13. A method for improving chemical mechanical polishing endpoint detection during planarization of a semiconductor wafer as described in Claim 9
25 wherein said step (b) comprises:

depositing said dielectric layer over said reflectance stop layer and said component, wherein said dielectric layer is comprised of an oxide.

14. A device adapted for improving chemical mechanical polishing endpoint detection during planarization of a semiconductor wafer, said device comprising:

a component disposed on a semiconductor wafer;

a reflectance stop layer disposed above said component, wherein said reflectance stop layer substantially reduces any light from reflecting off of said component; and

a dielectric layer disposed over said reflectance stop layer and said component.

15. A device of Claim 14 adapted for improving chemical mechanical polishing endpoint detection during planarization of a semiconductor wafer wherein said reflectance stop layer is a silicon oxy-nitride layer.

16. A device of Claim 14 adapted for improving chemical mechanical polishing endpoint detection during planarization of a semiconductor wafer wherein said reflectance stop layer is an amorphous silicon layer.

17. A device of Claim 14 adapted for improving chemical mechanical polishing endpoint detection during planarization of a semiconductor wafer wherein said component is a metal component.

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18. A device of Claim 14 adapted for improving chemical mechanical polishing endpoint detection during planarization of a semiconductor wafer wherein said dielectric layer is an oxide layer.

5 19. A method for improving chemical mechanical polishing endpoint detection during planarization of a semiconductor wafer, said method comprising the step of:

depositing a first dielectric layer above a reflectance stop layer disposed above a second dielectric layer disposed over a component disposed on a semiconductor wafer, wherein said reflectance stop layer substantially reduces any light from reflecting off of other surfaces except said component during determination of the thickness of said second dielectric layer above said component using a reflected signal of light.

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15 20. A method for improving chemical mechanical polishing endpoint detection during planarization of a semiconductor wafer as described in Claim 19 wherein said step comprises:

depositing said first dielectric layer above said reflectance stop layer, wherein said reflectance stop layer is comprised of a silicon oxy-nitride.

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21. A method for improving chemical mechanical polishing endpoint detection during planarization of a semiconductor wafer as described in Claim 19 wherein said step comprises:

depositing said first dielectric layer above said reflectance stop layer, wherein said reflectance stop layer is comprised of an amorphous silicon.

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22. A method for improving chemical mechanical polishing endpoint detection during planarization of a semiconductor wafer as described in Claim 19 wherein said step comprises:

5 depositing said first dielectric layer above said reflectance stop layer disposed above said second dielectric layer disposed over said component, wherein said component is comprised of a metal.

23. A method for improving chemical mechanical polishing endpoint detection during planarization of a semiconductor wafer as described in Claim 19 wherein said step comprises:

depositing said first dielectric layer above said reflectance stop layer, wherein said first dielectric layer is comprised of an oxide.

15 24. A method for improving chemical mechanical polishing endpoint detection during planarization of a semiconductor wafer as described in Claim 19 wherein said step comprises:

depositing said first dielectric layer above said reflectance stop layer disposed above said second dielectric layer, wherein said second dielectric layer is comprised
20 of an oxide.

25. A method for improving chemical mechanical polishing endpoint detection during planarization of a semiconductor wafer as described in Claim 19 wherein said step comprises:

depositing said first dielectric layer above said reflectance stop layer disposed above said second dielectric layer, wherein said first dielectric layer is comprised of an oxide and said second dielectric layer is comprised of an oxide.

- 5 26. A method for improving chemical mechanical polishing endpoint detection during planarization of a semiconductor wafer, said method comprising the steps of:
- (a) depositing a first dielectric layer over a component disposed on a semiconductor wafer;
 - 10 (b) depositing a reflectance stop layer above said first dielectric layer;
 - (c) depositing a second dielectric layer above said reflectance stop layer;
 - (d) removing material from said second dielectric layer and said reflectance stop layer disposed above said semiconductor wafer using a chemical mechanical polishing process, wherein said second dielectric layer and said reflectance stop layer subsequently are substantially removed from above said component;
 - 15 (e) determining the thickness of said first dielectric layer above said component using a reflected signal of light, wherein said reflectance stop layer that remains substantially reduces any light from reflecting off of other surfaces except said component; and
 - 20 (f) in response to said first dielectric layer substantially achieving a desired thickness above said component, stopping said chemical mechanical polishing process of said semiconductor wafer.

27. A method for improving chemical mechanical polishing endpoint detection during planarization of a semiconductor wafer as described in Claim 26 wherein said step (b) comprises:

depositing said reflectance stop layer above said first dielectric layer, wherein
5 said reflectance stop layer is comprised of a silicon oxy-nitride.

28. A method for improving chemical mechanical polishing endpoint detection during planarization of a semiconductor wafer as described in Claim 26 wherein said step (b) comprises:

10 depositing said reflectance stop layer above said first dielectric layer, wherein said reflectance stop layer is comprised of an amorphous silicon.

29. A method for improving chemical mechanical polishing endpoint detection during planarization of a semiconductor wafer as described in Claim 26

15 wherein said step (a) comprises:

depositing said first dielectric layer over said component, wherein said component is comprised of a metal.

30. A method for improving chemical mechanical polishing endpoint
20 detection during planarization of a semiconductor wafer as described in Claim 26

wherein said step (a) comprises:

depositing said first dielectric layer over said component, wherein said first dielectric layer is comprised of an oxide.

31. A method for improving chemical mechanical polishing endpoint detection during planarization of a semiconductor wafer as described in Claim 26 wherein said step (c) comprises:

- depositing said second dielectric layer above said reflectance stop layer,
- 5 wherein said second dielectric layer is comprised of an oxide.